

NEVADA BUREAU OF MINES AND GEOLOGY

BULLETIN 104

**OIL AND GAS
DEVELOPMENTS
IN NEVADA**

**LARRY J. GARSIDE, RONALD H. HESS,
KERYL L. FLEMING, AND BECKY S. WEIMER**

1988

**STATE DOC.
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LANDER COUNTY (continued)

Completed: 1946
Status: D & A
Depth: 329 ft
Remarks: This well was drilled for stratigraphic information.

VOORHEES, JESS H.

No. 5 S
API no.: 27-015-04993
Permit no.: LA3
Location: NW¼NW¼ sec. 27, T32N, R45E
Completed: 1946
Status: D & A
Depth: 143 ft
Remarks: This well was drilled for stratigraphic information.

VOORHEES, JESS H.

No. 6 S
API no.: 27-015-04992
Permit no.: LA2
Location: SE¼SE¼ sec. 3, T32N, R45E
Completed: 1946
Status: D & A
Depth: 448 ft
Remarks: This well was drilled for stratigraphic information.

LINCOLN COUNTY

Few wells have been drilled in Lincoln County, and only one well is known to have oil shows. Two surface occurrences (secs. 1 and 12, T6N, R62E; and sec. 34, T4N, R65E) of tarry bitumen are found in fossil cavities and calcite veinlets which occur in limestone concretions in the Mississippian Chainman Shale (Poole and Claypool, 1984; Bortz, 1985). Some hydrocarbon gas has been reported in some shallow water wells in Pahranaagat Valley in south-central Lincoln County (Scott McDaniel, oral commun., 1986).

Well Data

AMERICAN QUASAR PETROLEUM CO. OF NEW MEXICO

Adobe Federal No. 19-1
API no.: 27-017-05203
Permit no.: 270
Location: NE¼SW¼ sec. 19, T2N, R60E
1,980 ft from south line, 1,980 ft from west line
Elevation: 4,990 ft
Completed: Oct. 14, 1979
Status: Water well
Depth: 7,706 ft
Logs:
DI 160-7,683 ft
BHCS 160-7,676 ft
Cyberlook 4,750-7,683 ft
CNL/FDC 5,750-7,690 ft
Samples:
Cuttings 150-7,700 ft
Remarks: Fresh water zone at 4,605-4,767 ft

AMOCO PRODUCTION CO.

Dutch John Unit No. 1
API no.: 27-017-05204

Permit no.: 421
Location: NE¼NE¼SW¼ sec. 21, T7N, R66E
2,330 ft from south line, 2,350 ft from west line
Elevation: 5,923 ft
Completed: Nov. 14, 1985
Status: P & A
Depth: 12,750 ft

Tops:
Surface Quaternary valley fill
2,196 ft Tertiary volc.
4,906 ft Pennsylvanian ls.
5,770 ft Mississippian Diamond Peak ss.
6,592 ft Mississippian Chainman Sh.
8,028 ft Mississippian Joana Ls.
8,602 ft Devonian Pilot Sh.
8,756 ft Devonian Guilmette Fm.
- 11,712 ft Devonian Simonson Dol.

Logs:
Lithologic 0-12,750 ft
CNL/FDC 2,299-12,754 ft
DM 2,299-12,753 ft
GR 2,299-12,754 ft
BHCS 150-12,752 ft
MLL 8,120-12,743 ft
Cal 406-2,294 ft
CBL 5,600-8,120 ft
DI 2,299-11,502 ft

Samples:
Cuttings 0-12,750 ft
Remarks: Oil shows at 5,800-6,800 ft.

AMOCO PRODUCTION CO.

Garden Valley No. 1

API no.: 27-017-05207
Permit no.: 470
Location: NE¼SW¼ sec. 27, T2N, R57E
1,947 ft from south line, 2,372 ft from west line
Elevation: 5,516 ft
Completed: Apr. 3, 1986
Status: P & A
Depth: 6,401 ft

Tops:
Surface Quaternary valley fill
3,150 ft Tertiary volc.
5,900 ft Paleozoic(?) ls.

Logs:
Lithologic 1,200-6,393 ft
CN/FDC 1,797-6,372 ft
BHCS 1,650-6,340 ft
DM 1,797-6,372 ft
DI 1,650-6,369 ft

Samples:
Cuttings 1,800-6,400 ft

BRENT ENERGY, INC.

Shogrin Federal No. 1

API no.: 27-017-05205
Permit no.: 424
Location: SW¼NE¼SE¼ sec. 16, T6N, R66E
1,535 ft from south line, 1,025 ft from east line
Elevation: 5,954 ft
Completed: Sept. 24, 1985
Status: P & A
Depth: 9,178 ft

Logs:
Lithologic 1,550-9,178 ft
DI 8,137-9,162 ft
GR 1,592-8,144 ft
CNL 460-8,116 ft

LINCOLN COUNTY (continued)

LSS/BHCS 8,130-9,162 ft
 Samples:
 Cuttings 1,534-9,180 ft
 Remarks: DST [8,730-9,178 ft] recovered 2,500 ft of water.

FLETCHER, C.H.

Fletcher No. 1
 API no.: 27-017-05206
 Permit no.: 459
 Location: NE¼SW¼ sec. 30, T8N, R70E
 2,343 ft from south line, 2,422 ft from west line
 Elevation: 5,740 ft
 Completed: Jan. 8, 1986
 Status: P & A
 Depth: 7,481 ft

Tops:
 1,884 ft Tertiary ss.
 2,240 ft Tertiary anhydrite
 4,050 ft Tertiary claystone & ls.
 4,875 ft Tertiary conglomerate
 5,870 ft Tertiary volc.(?)
 5,924 ft Tertiary claystone & ls.
 6,436 ft Tertiary volc. tuff
 7,481 ft Tertiary TD in volc.

Logs:
 Lithologic 410-7,480 ft
 BHCS/GR 396-7,469 ft
 DI 396-7,469 ft

Samples:
 Cuttings 408-7,481 ft

GULF OIL CORP.

Cave Valley Unit Federal No. 1
 API no.: 27-017-05001
 Permit no.: 100
 Location: NE¼SE¼SE¼ sec. 19, T7N, R64E
 680 ft from south line, 500 ft from east line
 Elevation: 6,037 ft
 Completed: July 6, 1966
 Status: P & A
 Depth: 7,024 ft

Tops:
 Surface valley fill
 6,205 ft base of valley fill
 6,630 ft Paleozoic

Logs:
 Lithologic 0-7,024 ft
 DIL 488-7,024 ft
 FDL 488-7,023 ft
 BHCS/GR 488-7,014 ft
 ML 488-7,023 ft

Remarks: Water sands at 250-260 ft and 1,160-1,270 ft.

GULF OIL CORP.

Nevada-Federal CM No. 1
 API no.: 27-017-05002
 Permit no.: 95
 Location: center, NW¼NW¼ sec. 17, T1S, R60E
 660 ft from north line, 660 ft from west line
 Elevation: 4,940 ft
 Completed: Mar. 7, 1966
 Status: P & A
 Depth: 2,434 ft

Logs:
 BHCS/GR 0-2,428 ft
 DIL 768-2,432 ft

FDL 768-2,435 ft
 ML 768-2,435 ft
 DM 768-2,432 ft
 Remarks: Water zone at 660-800 ft.

PEASE, WILLARD DRILLING CO.

Federal No. 1
 API no.: 27-017-05000
 Permit no.: 79
 Location: center, NW¼NE¼ sec. 22, T9N, R63E
 660 ft from north line, 1,980 ft from east line
 Elevation: 6,540 ft at DF
 Completed: May 9, 1965
 Status: P & A
 Depth: 6,264 ft
 Logs:
 IES 504-6,268 ft
 S/Cal 504-6,271 ft

TENNECO OIL CO.

GB Core Hole No. 13
 API no.: 27-017-05200
 Permit no.: 138
 Location: SE¼NW¼ sec. 29, T7N, R63E
 2,250 ft from north line, 2,200 ft from west line
 Elevation: 6,200 ft
 Completed: Aug. 19, 1970
 Status: P & A
 Depth: 488 ft
 Tops:
 Surface alluvium
 13 ft Pennsylvanian Ely Ls.
 265 ft Mississippian Diamond Peak
 Fm. and Chainman Sh.

Logs:
 Lithologic 0-488 ft
 GR 0-489 ft
 Samples:
 Cuttings 0-480 ft
 Remarks: Water at 288 ft.

TEXACO INC.

Federal No. 1
 API no.: 27-017-05201
 Permit no.: 155
 Location: SE¼SE¼NE¼ sec. 18, T12S, R65E
 2,800 ft from south line, 200 ft from east line
 Elevation: 3,693 ft
 Completed: Dec. 4, 1972
 Status: P & A
 Depth: 7,030 ft

Logs:
 Lithologic 650-7,030 ft
 DLL 30-7,016 ft
 CNL/FDC 2,300-6,538 ft
 PML 2,300-6,538 ft
 DM 2,300-7,026 ft

Samples:
 Cuttings 20-7,030 ft
 Remarks: Palynology and source-rock report available at NBMG.

LYON COUNTY

Considerable oil prospecting took place in Lyon County in the early 1900's, and at least two wells were drilled. Anderson (1909c) reported that there was little

NYE COUNTY (continued)

BOPD (API gravity = 12.9°, pour point = 80°F). A total of 635 bbl was produced in 1979. The well was shut in until 1983 when 11 bbl was produced. The well never produced again and was P & A in 1986.

NORTHWEST EXPLORATION CO.

Grant Canyon No. 1

API no.: 27-023-05318

Permit no.: 353

Location: center, E½SW¼NW¼ sec. 21, T7N, R57E

1,980 ft from north line, 560 ft from west line

Elevation: 4,735 ft

Completed: Sept. 11, 1983

Status: Producer

Field: Grant Canyon

Depth: 4,487 ft

Tops:

Surface	Quaternary valley fill
4,342 ft	Devonian Guilmette Ls.

Logs:

Lithologic	0-4,486 ft
BHCS/GR	456-4,471 ft
CNL/FDC	4,200-4,480 ft
FIL	4,100-4,476 ft
DI	456-4,480 ft

Samples:

Cuttings	0-4,486 ft
Core	4,471-4,485 ft

Remarks: Discovery well of the Grant Canyon Field. Producing at 4,374-4,426 ft. Producing formation is Devonian Guilmette. Currently operated by Apache Corp., formerly by Harper Oil Co. Core analysis is available at NBMG. DST at 4,441-4,340 ft had an oil show. This well initially flowed 1,816 BOPD.

NORTHWEST EXPLORATION CO.

Little Meadows No. 1

API no.: 27-023-05263

Permit no.: 239

Location: center, NE¼NE¼ sec. 32, T6N, R56E

657 ft from north line, 660 ft from west line

Elevation: 4,745 ft

Completed: July 16, 1978

Status: P & A

Depth: 5,291 ft

Tops:

Surface	Quaternary valley fill
2,768 ft	Tertiary volc.
5,020 ft	Paleozoic

Logs:

Lithologic	443-5,291 ft
DIL	434-5,286 ft
BHCS/GR	435-5,281 ft
CNL/FDC	435-5,290 ft

Samples:

Cuttings	70-5,270 ft
Core	5,270-5,291 ft

Remarks: Water analysis available on DST's at NBMG. DST at 2,589-2,775 ft had a slight oil show.

NORTHWEST EXPLORATION CO.

Railroad Valley No. 1

API no.: 27-023-05290

Permit no.: 291

Location: SW¼SW¼ sec. 20, T10N, R57E

660 ft from south line, 660 ft from west line

Elevation: 4,847 ft

Completed: Dec. 21, 1980

Status: P & A

Depth: 3,643 ft

Tops:

Surface	Quaternary valley fill
2,580 ft	Tertiary volc.

Logs:

Lithologic	300-3,514 ft
DIL	300-3,526 ft
CNL	300-3,526 ft

Samples:

Cuttings	300-3,643 ft
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Remarks: Dead oil shows reported in valley fill at 600-690 ft and 870-1,470 ft.

NORTHWEST EXPLORATION CO.

Railroad Valley No. 2

API no.: 27-023-05298

Permit no.: 306

Location: center, SW¼ sec. 36, T10N, R57E

1,320 ft from south line, 1,320 ft from west line

Elevation: 4,921 ft

Completed: May 9, 1981

Status: P & A

Depth: 5,150 ft

Tops:

Surface	Quaternary valley fill
3,970 ft	Tertiary weathered volcanic flows and ash
4,650 ft	Tertiary Garrett Ranch Volc.

Logs:

Lithologic	390-5,150 ft
DIL	382-5,145 ft
BHCS	382-5,145 ft
FDC/CNL/GR	382-5,145 ft

Samples:

Cuttings	390-5,150 ft
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Remarks: Oil show at 4,200-4,210 ft.

NORTHWEST EXPLORATION CO.

Railroad Valley No. 3

API no.: 27-023-05297

Permit no.: 305

Location: center, NW¼ sec. 31, T9N, R56E

1,320 ft from north line, 1,320 ft from west line

Elevation: 4,868 ft

Completed: May 23, 1981

Status: P & A

Depth: 1,500 ft

Tops:

Surface	Quaternary valley fill
630 ft	Tertiary volc.

Logs:

Lithologic	129-1,505 ft
N/GR/FDC	130-1,502 ft
S	124-1,496 ft
DIL	124-1,502 ft

Samples:

Cuttings	130-1,530 ft
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NORTHWEST EXPLORATION CO.

Railroad Valley No. 4

API no.: 27-023-05296

Permit no.: 304

Location: SW¼ sec. 4, T8N, R56E

1,320 ft from south line, 1,320 ft from west line

Elevation: 4,735 ft

Completed: Aug. 26, 1979

Status: P & A

Depth: 5,957 ft

Logs:

DIL	1,060-5,951 ft
CNL/FDC	1,060-5,953 ft
BHCS	1,060-5,945 ft
FDC	1,060-5,953 ft
Spectralog	50-5,953 ft

Samples:

Cuttings	30-5,940 ft
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AMERICAN HUNTER EXPLORATION

Black Jack Springs Federal No. 1

API no.: 27-033-05243

Permit no.: 300

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T14N, R60E

2,488 ft from north line, 279 ft from east line

Elevation: 6,520 ft

Completed: Feb. 2, 1981

Status: P & A

Depth: 8,125 ft

Tops:

Surface	Quaternary valley fill
440 ft	Tertiary volc.
1,728 ft	Mississippian Diamond Peak Fm.
2,320 ft	brown sh.
2,827 ft	Mississippian Joana Ls.
3,320 ft	Mississippian Pilot Sh.
3,462 ft	Devonian Guilmette Ls.
4,858 ft	Devonian Simonson Dol.
5,877 ft	Devonian Sevy Dol.
6,806 ft	Silurian Laketown Dol.
7,688 ft	Ordovician Eureka Qtz.
8,012 ft	Ordovician Pogonip Gp.

Logs:

Lithologic	40-8,125 ft
Directional survey	823-2,838 ft
DM	826-8,142 ft
DIL	0-8,148 ft
CNL/FDC	100-8,140 ft
PL	3,286-8,140 ft
GR	100-8,140 ft
DLL	3,286-8,139 ft

Samples:

Cuttings	0-8,125 ft
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Remarks: Maturation analysis and palynology report available at NBMG.

AMERICAN QUASAR PETROLEUM CO.

Long Valley Federal No. 34-1

API no.: 27-033-05230

Permit no.: 228

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T22N, R58E

1,400 ft from north line, 300 ft from east line

Elevation: 6,103 ft

Completed: May 12, 1978

Status: P & A

Depth: 6,563 ft

Tops (from PI):

1,050 ft	Tertiary volc.
2,710 ft	Pennsylvanian
2,918 ft	Mississippian Chainman Sh.
4,536 ft	Mississippian Joana Ls.
5,070 ft	Mississippian Pilot Sh.
5,910 ft	Devonian Guilmette Ls.

Logs:

DIL	1,000-5,994 ft
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BHCS	1,000-4,990 ft
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CNL/FDC	1,000-5,003 ft
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GR/N	4,400-6,562 ft
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Samples:

Cuttings	1,090-5,930 ft
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Remarks: Organic-maturation analysis available at NBMG.

Oil shows are rumored at approximately 3,000 ft (Hotline Energy Reports, May 11, 1985).

AMOCO PRODUCTION CO.

Stage Line Unit No. 1-A

API no.: 27-033-05252

Permit no.: 427

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 22, T23N, R56E

370 ft from south line, 1,750 ft from west line

Elevation: 5,882 ft

Completed: May 24, 1985

Status: P & A

Depth: 8,500 ft

Tops:

Surface	Quaternary valley fill
482 ft	Mississippian Diamond Peak Fm.
902 ft	Mississippian Chainman Sh.
1,800 ft	Mississippian/Devonian Joana Ls.
2,124 ft	Mississippian/Devonian Pilot Sh.
2,382 ft	Devonian Nevada Fm.-
	Devils Gate Ls. Mbr.
3,927 ft	Devonian Nevada Fm.-
	Bay State Dol. Mbr.
4,746 ft	Devonian Nevada Fm.-
	Woodpecker Ls. Mbr.
4,932 ft	Devonian Nevada Fm.-
	Sentinel Mountain Dol. Mbr.
6,794 ft	Devonian Nevada Fm.-
	Oxyoke Canyon Ss. Mbr.
7,000 ft	Devonian Nevada Fm.-
	Beacon Peak Dol. Mbr.
7,228 ft	Silurian/Ordovician (?)

Logs:

Lithologic	60-8,500 ft
GR	879-8,465 ft
DM	6,008-8,495 ft
BHCS	879-8,484 ft
LSS/GR/Cal	6,008-8,484 ft
DI	879-5,006 ft
CNL/FDC	879-8,498 ft
DLL	3,000-8,485 ft
TS	0-2,919 ft
S	6,008-8,484 ft

Samples:

Cuttings	30-8,500 ft
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Remarks: Dead oil and gas show reported at 900-910 ft. Stage Line Unit No. 1 was located 30 ft north of this well. It was P & A at 1,902 ft in depth, no logs, cores, or tests were made. This well is a redrill of Stage Line No. 1. Lithologic log for No. 1 is available at NBMG. Stage Line Unit No. 1-A encountered water sands at 2,696 ft that flowed 60 BWPM and at 2,992 ft that flowed 50 BWPM.

COMMODORE RESOURCES

Outlaw Federal No. 1

API no.: 27-033-05245

Permit no.: 337

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 1, T10N, R70E

860 ft from north line, 810 ft from east line

Elevation: 5,444 ft

Completed: Dec. 13, 1983

Status: P & A

WHITE PINE COUNTY (continued)**Tops (from PI):**

1,265 ft	Permian
1,318 ft	Pennsylvanian
5,465 ft	Mississippian
6,340 ft	Mississippian Joana Ls.
6,635 ft	Devonian Pilot Sh.

Logs:

Lithologic	1,450-7,020 ft
D1/GR	0-4,899 ft
Densilog	4,900-6,296 ft

Samples:

Cuttings	1,450-7,200 ft
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Remarks: Ten oil and gas zones encountered from 3,740 ft to 5,870 ft. Many fresh water sands encountered at 0-4,633 ft. Source-rock analysis reports available at NBMG.

GULF OIL CORP.**Jake's Wash Unit No. 4**

API no.: 27-033-05224

Permit no.: 175

Location: E $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T14N, R61E

713 ft from north line, 972 ft from west line

Elevation: 6,210 ft

Completed: Aug. 22, 1975

Status: P & A

Depth: 4,600 ft

Tops:

Surface	ls. and chert
1,531 ft	sh. and ss.
3,920 ft	Devonian

Logs:

DIL	1,523-3,453 ft
CNL/FDC	1,530-3,457 ft
DM	2,380-3,453 ft
Directional	2,381-3,453 ft

Samples:

Cuttings	40-4,600 ft
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GULF OIL CORP.**Newark Valley Unit No. 1 (Nevada-Federal CG)**

API no.: 27-033-05052

Permit no.: 99

Location: center, SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T19N, R55E

1,980 ft from north line, 660 ft from west line

Elevation: 5,877 ft

Completed: Apr. 14, 1966

Status: P & A

Depth: 5,001 ft

Tops:

Surface	valley fill
3,940 ft	base of valley fill
4,936 ft	Paleozoic

Logs:

DIL	488-5,043 ft
GR/BHCS	488-5,038 ft
FDC/GR	488-5,046 ft
ML	488-5,046 ft

GULF OIL CORP. OF CALIFORNIA**Gose "DQ" Federal "A" No. 1**

API no.: 27-033-05201

Permit no.: 120

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T10N, R61E

914 ft from north line, 908 ft from west line

Elevation: 5,382 ft

Completed: Aug. 22, 1968

Status: P & A

Depth: 4,957 ft

Tops:

Surface	Quaternary valley fill
1,050 ft	Tertiary volc.
2,393 ft	Eocene Sheep Pass Fm.
3,010 ft	Pennsylvanian Ely Ls.
4,624 ft	Mississippian Chainman Sh.
4,730 ft	Mississippian Joana Ls.

Logs:

Lithologic	480-4,950 ft
IES	606-4,946 ft
FDC/GR	900-3,737 ft
SNP	900-3,737 ft
BHCS/GR/Cal	606-4,948 ft
DIL	606-4,946 ft

GULF OIL CORP. OF CALIFORNIA**Nevada-Federal "A" No. 1**

API no.: 27-033-05053

Permit no.: 90

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 17, T19N, R64E

4,593 ft from north line, 673 ft from east line

Elevation: 6,186 ft

Completed: Nov. 4, 1965

Status: P & A

Depth: 6,100 ft

Tops:

Surface	Quaternary valley fill
2,008 ft	base of valley fill (from PI)
5,890 ft	Paleozoic

Logs:

FDC/GR	646-6,097 ft
ML	2,300-6,097 ft
DM	648-6,093 ft
DIL	646-6,092 ft

Samples:

Cuttings	0-6,100 ft
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Remarks: Tertiary source-rock analysis is available at NBMG. Test data, DST 5,115-5,264 ft, from Petroleum Information.

GULF OIL CORP. OF CALIFORNIA**Nevada-Federal "BS" No. 1**

API no.: 27-033-05054

Permit no.: 93

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 14, T20N, R61E

877 ft from south line, 559 ft from east line

Elevation: 6,266 ft

Completed: Jan. 15, 1966

Status: P & A

Depth: 2,978 ft

Logs:

BHCS/GR	503-2,973 ft
ML	503-2,980 ft
DIL	503-2,977 ft
DM	503-2,977 ft
FDC/GR	503-2,980 ft

GULF OIL CORP. OF CALIFORNIA**Nevada-Federal "O" No. 1**

API no.: 27-033-05051

Permit no.: 85

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30, T16N, R64E

1,866 ft from north line, 1,960 ft from east line

Elevation: 6,586 ft

Completed: Sept. 4, 1965

Status: P & A
Depth: 2,690 ft
Remarks: Abandoned because of lost circulation.

GULF OIL CORP. OF CALIFORNIA

Nevada-Federal "O" No. 2

API no.: 27-033-05050

Permit no.: 92

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30, T16N, R64E
990 ft from north line, 330 ft from west line

Elevation: 6,407 ft

Completed: Nov. 30, 1965

Status: P & A

Depth: 3,253 ft

Logs:

DIL	468-3,256 ft
BHCS/GR	468-3,250 ft
ML	468-3,256 ft
FDC/GR	468-3,256 ft
DM	468-3,254 ft

Samples:

Cuttings 0-3,250 ft (incomplete)

GULF REFINING CO.

Denulson-Federal No. 1

API no.: 27-033-05007

Permit no.: 2

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 20, T26N, R70E
2,203 ft from south line, 997 ft from west line

Elevation: 5,492 ft

Completed: Mar. 1, 1954

Status: P & A

Depth: 4,498 ft

Tops:

2,215 ft	Permian Gerster-Phosphoria Ls.
3,245 ft	sts.
3,330 ft	ls.
3,350 ft	sh.
3,540 ft	dol.
3,860 ft	ls.
4,030 ft	dol.

Logs:

Lithologic	0-4,502 ft
ES	547-4,502 ft
GR/N	130-4,501 ft

Samples:

Cuttings 0-4,498 ft

Remarks: Fresh water zones at 3,540-3,675 ft and 4,135-4,350 ft. Core descriptions available at NBMG.

HARPER OIL CO.

Conoco Federal No. 19-1

API no.: 27-033-05251

Permit no.: 409

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T13N, R62E
663 ft from north line, 2,429 ft from east line

Elevation: 5,785 ft

Completed: Oct. 17, 1985

Status: P & A

Depth: 4,912 ft

Tops:

Surface	Quaternary valley fill
447 ft	Tertiary volc.
692 ft	Tertiary cgl.
830 ft	Permian talus
943 ft	Permian Arcturus Fm.
2,377 ft	Permian Rib Hill Ss.
2,460 ft	Pennsylvanian Ely Ls.
2,766 ft	Mississippian Chainman Sh.

Logs:

Lithologic	78-4,912 ft
GR	4,300-4,890 ft
Cyberlook	2,000-3,200 ft
Directional	1,084-3,383 ft

Samples:

Cuttings 78-3,726 ft

Remarks: Oil shows, 2,940-3,020 ft, 3,340 ft, and 4,817-4,873. Sidetracked below 2,951 ft. Lost-circulation problems.

ILLIPAH PETROLEUM SYNDICATE

No. 1

API no.: 27-033-05055

Permit no.: WP1

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T17N, R58E
1,100 ft from south line, 250 ft from east line

Elevation: 6,200 ft

Completed: Dec. 15, 1920

Status: P & A

Depth: 929 ft

Tops:

Surface Mississippian Chainman Sh.

Logs:

Lithologic 0-929 ft

Remarks: Gas show at 94-95 ft, oil shows at 395-445 ft and at 895 ft. See Lintz (1957a, p. 61-62).

ILLIPAH PETROLEUM SYNDICATE

No. 2

API no.: 27-033-05056

Permit no.: WP2

Location: E $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T17N, R58E
560 ft from south line, 360 ft from east line

Elevation: 6,200 ft

Completed: Oct. 10, 1926

Status: P & A

Depth: 1,572 ft

Tops:

Surface Mississippian Chainman Sh.

Logs:

Lithologic 0-1,572 ft

Remarks: Oil shows at 684-688 ft and 1,151-1,560 ft. Oil and gas show at 401-402 ft, and a gas show at 250-252 ft. See Lintz (1957a, p. 62-63).

ILLIPAH PETROLEUM SYNDICATE

No. 3

API no.: 27-033-05057

Permit no.: WP4

Location: E $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T17N, R58E
560 ft from south line, 388 ft from east line

Elevation: 6,200 ft

Completed: Sept. 19, 1928

Status: P & A

Depth: 678 ft

Tops:

Surface Mississippian Chainman Sh.

Remarks: Oil show at 664-678 ft, oil and gas shows at 507-527 ft, and at 400-403 ft.

ILLIPAH PETROLEUM SYNDICATE

No. 4

API no.: 27-033-05058

Permit no.: WP3

Location: E $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T17N, R58E
560 ft from south line, 400 ft from east line

Elevation: 6,200 ft

WHITE PINE COUNTY (continued)*Completed:* Aug. 1928*Status:* P & A*Depth:* 1,302 ft*Tops:*

Surface Mississippi Chainman Sh.

Remarks: Oil and gas show at 527-530 ft. At times enough gas escaped through the hole to be ignited (Humphrey, 1960, p. 110-111).**KEWANEE OIL AND GAS CO.****Federal Ely No. 1***API no.:* 27-033-05220*Permit no.:* 167*Location:* SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T15N, R63E
422 ft from south line, 1,660 ft from east line*Elevation:* 8,200 ft*Completed:* Nov. 4, 1975*Status:* P & A*Depth:* 780 ft*Tops:*Surface Mississippi Chainman Sh.
(to bottom)*Remarks:* Water was encountered at 450 ft. This was only a 6-inch test well.**LOUISIANA LAND & EXPLORATION CO.****U.S.A.-Steptoe Valley No. 1***API no.:* 27-033-05236*Permit no.:* 267*Location:* NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T23N, R63E
660 ft from north line, 2,250 ft from west line*Elevation:* 5,910 ft*Completed:* Aug. 20, 1979*Status:* P & A*Depth:* 6,444 ft*Logs:*BHCS 799-6,417 ft
TS 120-6,409 ft
DIL 798-6,405 ft*Samples:*

Cuttings 800-6,450 ft

MARLIN OIL CO.**Federal No. 1-5***API no.:* 27-033-05250*Permit no.:* 403*Location:* center, SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T25N, R62E
660 ft from south line, 660 ft from west line*Elevation:* 6,295 ft*Completed:* Jan. 8, 1985*Status:* P & A*Depth:* 10,530 ft*Tops:*Surface Quaternary valley fill
1,670 ft Oligocene volcanic flows
3,298 ft Permian Riepetown Ss.
5,126 ft Permian Pakoon Dol.
6,052 ft Pennsylvanian Ely Fm.
9,200 ft Mississippian Chainman Fm.*Logs:*Lithologic 1,080-10,530 ft
DIL 95-10,520 ft
CNL/FDC 4,528-10,524 ft*Samples:*

Cuttings 1,070-10,530 ft

Remarks: Sporadic trace to fair oil shows reported.**NORTHWEST EXPLORATION CO.****Illipah No. 1***API no.:* 27-033-05237*Permit no.:* 269*Location:* center, NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T17N, R58E
660 ft from north line, 660 ft from east line*Elevation:* 6,851 ft*Completed:* Jan. 21, 1980*Status:* P & A*Depth:* 7,154 ft*Tops:*Surface Mississippi Chainman Sh.
2,265 ft Mississippian Joana Ls.
3,605 ft Mississippian Pilot Sh.
3,940 ft Devonian Guilmette Ls.
5,905 ft Devonian Simonson Dol.
6,695 ft Devonian Sevy Dol.*Logs:*Lithologic 70-7,154 ft
DI 5,297-7,152 ft
BHCS 4,893-7,152 ft
GR/N 50-5,026 ft*Samples:*

Cuttings 70-7,150 ft

Remarks: Oil shows, especially in top 760 ft. Source-rock analysis available at NBMG.**NORTHWEST EXPLORATION CO.****Jake's Wash No. 5A***API no.:* 27-033-05233*Permit no.:* 237*Location:* NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T14N, R60E
1,334 ft from south line, 1,253 ft from west line*Elevation:* 6,445 ft*Completed:* June 14, 1978*Status:* P & A*Depth:* 4,410 ft*Logs:*Driller 1,630-4,410 ft
DLL 1,380-4,376 ft
FDC/CNL/GR 2,000-4,389 ft*Samples:*

Cuttings 70-4,410 ft

Remarks: Organic-maturation analysis, Chainman source-rock analysis, and water analysis of DST's are available at NBMG. Oil shows (cut fluorescence) reported.**NORTHWEST EXPLORATION CO.****White River No. 2***API no.:* 27-033-05239*Permit no.:* 274*Location:* center, SE $\frac{1}{4}$ sec. 13, T10N, R61E
1,320 ft from south line, 1,320 ft from east line*Elevation:* 5,440 ft*Completed:* Mar. 17, 1980*Status:* P & A*Depth:* 7,588 ft*Tops:*Surface Quaternary valley fill
1,571 ft Tertiary volc.
3,845 ft Tertiary Stinking Spring Cgl.
4,170 ft Eocene Sheep Pass Fm.
6,298 ft Mississippian Chainman Sh. (fault)
7,389 ft Mississippian Joana Ls.*Logs:*Lithologic 810-7,588 ft
DIL 780-7,568 ft
BHCS 780-7,561 ft

Remarks: Numerous oil and gas shows were reported on this well. Source-rock analysis is available at NBMG. See McJannet and Clark (1960b).

SUNTIDE PETROLEUM, INC.

Nevada Federal "A" No. 1

API no.: 27-033-05005

Permit no.: 74

Location: center, W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T18N, R57E

Elevation: 6,588 ft

Completed: Sept. 2, 1964

Status: P & A

Depth: 7,980 ft

Tops (from PI):

1,132 ft	Pennsylvanian Ely Ls.
1,248 ft	Mississippian Chainman Sh.
2,823 ft	Mississippian Joana Ls.
2,982 ft	Devonian Guilmette Ls.
3,882 ft	Devonian Simonson Dol.
5,258 ft	Devonian Sevy Dol.
6,112 ft	Silurian Laketown Dol.
7,300 ft	Ordovician Fish Haven Dol.
7,816 ft	Ordovician Eureka Qtz.

Logs:

GR/N	40-7,983 ft
LL	3,383-7,973 ft
S/Cal	3,385-7,978 ft

Samples:

Cuttings 1,350-4,941 ft

Remarks: Water zone at 140-308 ft tested to 45 GPM with fluid level at 170 ft. Source-rock analysis available at NBMG.

SUNTIDE PETROLEUM, INC.

Nevada Federal No. 1

API no.: 27-033-05002

Permit no.: 53

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T15N, R57E

665 ft from north line, 1,880 ft from east line

Elevation: 6,675 ft at KB

Completed: Apr. 28, 1961

Status: P & A

Depth: 2,681 ft

Tops (from PI):

Surface	Pennsylvanian Ely Ls.
400 ft	Mississippian Chainman Sh.
1,550 ft	Devonian Guilmette Ls.
2,050 ft	Devonian Simonson Dol.

Logs:

Lithologic	0-2,681 ft
IES	310-1,068 ft
S	50-1,100 ft

Remarks: Fresh water at 360-470 ft.

TANNEHILL OIL CO.

Federal N6509 No. 1

API no.: 27-033-05232

Permit no.: 235

Location: center, SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T19N, R57E

660 ft from south line, 660 ft from west line

Elevation: 6,229 ft

Completed: Sept. 13, 1978

Status: Water well

Depth: 677 ft

Samples:

Cuttings 0-677 ft (incomplete)

Remarks: Formerly TransOcean Oil, Inc. Fresh water horizon in Ely Ls.

TANNEHILL OIL CO.

Federal N6509 No. 2

API no.: 27-033-05234

Permit no.: 243

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T19N, R57E

804 ft from south line, 2,184 ft from west line

Elevation: 6,281 ft

Completed: Oct. 25, 1978

Status: Water well

Depth: 3,003 ft

Tops (from PI):

1,729 ft Chainman Sh.

Logs:

Lithologic	700-3,003 ft
DI	310-2,991 ft
Cal	315-1,874 ft
Velocity	310-1,841 ft

Samples:

Cuttings 1,956-3,003 ft

Remarks: Core and source-rock analyses are available at NBMG. Fresh water horizon in the Ely Ls.

TENNECO OIL CO.

GB Core Hole No. 2

API no.: 27-033-05207

Permit no.: 141

Location: center, NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T22N, R59E

1,980 ft from south line, 1,980 ft from west line

Elevation: 6,750 ft

Completed: June 3, 1970

Status: P & A

Depth: 365 ft

095Tops:

Surface	alluvium
48 ft	Mississippian Diamond Peak Fm. (to TD)

Logs:

Lithologic	0-365 ft
ES/GR	0-245 ft

Samples:

Cuttings 0-365 ft

Remarks: Water was encountered at 250 ft. Source-rock analysis is available at NBMG.

TENNECO OIL CO.

GB Core Hole No. 3

API no.: 27-033-05208

Permit no.: 142

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 25, T21N, R60E

175 ft from south line, 2,350 ft from west line

Elevation: 6,360 ft

Completed: June 20, 1970

Status: P & A

Depth: 956 ft

Tops:

Surface	Quaternary alluvium
20 ft	Pennsylvanian Ely Ls.
250 ft	Mississippian Diamond Peak Fm.

Logs:

Lithologic	0-956 ft
ES/GR	5-951 ft

Samples:

Cuttings 0-950 ft

Remarks: Water was encountered at 330 ft and at 630 ft. Source-rock analysis is available at NBMG.

TENNECO OIL CO.

GB Core Hole No. 4

API no.: 27-033-05209

NEVADA BUREAU OF MINES AND GEOLOGY

BULLETIN 91

THERMAL WATERS OF NEVADA

**LARRY J. GARSIDE
JOHN H. SCHILLING**

Descriptions of Nevada's thermal waters in springs, wells, and mine workings: locations, geology, temperatures, flow rates, water chemistry, well depths, drilling and other exploration activities, and past and present uses.



**MACKAY SCHOOL OF MINES
UNIVERSITY OF NEVADA • RENO
1979**

INTRODUCTION

Purpose and scope

The goal of this report is to provide basic information that can be used to determine the potential of Nevada's geothermal resources and aid in their exploration, development, and utilization—to bring together under one cover all the scattered data, published and unpublished, on Nevada's thermal waters, both hot water and steam. Information about springs, wells, mine workings, and other occurrences is included. Nevada does have huge geothermal-energy resources, as this report indicates, however, no attempt was made to evaluate the potential of any given area in the State.

Although we have tried to be as complete as practicable without making an exhaustive search, this report should be considered as preliminary and incomplete—a first pass at collecting existing data. The bibliography lists most of the references containing information on Nevada thermal waters. Many errors probably have been perpetuated because temperatures, flow rates, and chemical analyses were not field-checked.

The Nevada Bureau of Mines and Geology will continue to collect data on geothermal resources; this information will be available for inspection (by appointment), and staff members will continue to be available to answer questions.

Corrections, as well as additional information, are welcome (please send to Larry Garside, the senior author).

Organization of report

Much of the data collected is given in tabular form in *Appendix 1* (Nevada Thermal Water Data) and *Appendix 2* (Exploratory Geothermal Drilling in Nevada). It also is summarized in narrative form, alphabetically by county and by geothermal area, in the section preceding the two Appendices. In a general way the descriptions of geothermal areas within individual counties are arranged according to maximum reported temperature.

Definition of thermal water

This report lists all warm or hot (anomalously thermal) water—water that has a higher temperature than it would be affected only by “normal” wall-rock and/or surface temperatures. Unfortunately, it is difficult at best to determine an accurate cutoff for individual springs or wells.

Subsurface temperatures are affected by climatic conditions to depths of about 100 feet; below 100 feet temperatures in most of Nevada “normally” increase about 1°F every 55 feet, but increase more rapidly in areas of anomalously high heat flow. The water temperature in a spring or well depends on: (1) the surface-water temperature at the ground-water recharge point; (2) heating or cooling during near-surface movement; (3) heating during movement to greater depths; (4) cooling in returning to the surface or shallower depths; and (5) cooling or heating by mixing with other ground water.

Unfortunately all the information needed to determine accurately the absolute minimum temperature necessary for a well or spring to be thermal, is never available. In this report we have used 70°F as an arbitrary cutoff for springs

and water wells; in a few cases springs with temperatures above 70°F have been omitted for various specific reasons, and in Pahrump Valley and the Las Vegas basin water wells were omitted when they fell below the temperature expected from a normal geothermal gradient.

Because an arbitrary cutoff had to be used, some truly thermal wells and springs undoubtedly have been left out of this report, and some nonthermal occurrences have undoubtedly been included. Users should also keep in mind that “cold” (nonthermal) and warm water can chemically indicate the presence of anomalously hot temperatures at depth; cold springs and wells should not be ignored when exploring for geothermal resources.

Definition of geothermal area

In this report a geothermal area must: (1) have at least one known occurrence of thermal water; and (2) form a geographic cluster and/or appear to have a common source and form a continuous anomaly at depth. Information is usually lacking to prove a connection between two or more occurrences, and in many cases springs and wells have been grouped together only to simplify their presentation. Thus the limits of each geothermal area have had to be defined in a rather arbitrary manner.

System of naming and numbering

Geothermal areas have been assigned geographical names—usually that of the largest, best known hot spring, or less commonly of a well-known feature in the area. Hot-spring names used in this report are those considered to be the most widely used; where needed, other alternate names are listed in parentheses after the primary name. It is hoped that the primary names will be used whenever possible.

Each hot-spring group, geothermal area, and isolated hot spring has been given a unique identification number which is used in the text and tables, as well as on plate 1.

Location

Section-township-range locations are given for each spring and well. Where more detailed locations are known the quarter-quarter-quarter system is used (for example: NE/4 SE/4 NW/4 S5,T20,R30E indicates that the occurrence is located within approximately a 10 acre parcel which is the northeast quarter of the southeast quarter of the northwest quarter of Section 5, Township 20 North, Range 30 East). In some cases, these described locations were estimated by projecting the land grid into unsurveyed areas.

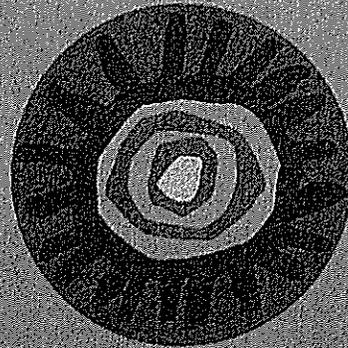
Usually the location of springs and wells is from (or was cross-checked with) U. S. Geological Survey 7½', 15', and 1x2° topographic quadrangle maps, using the most detailed map available for a given area. Unless the well or spring is actually shown and named on the map, or the location was field-checked, the location information was taken from the reference listed and may be wrong. Incorrect locations were found in many published reports, and some undoubtedly are carried over to this report.

Acknowledgements

So many individuals and organizations have contributed to this report that we have not listed them individually in

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DESERT RESEARCH INSTITUTE/UNIVERSITY OF NEVADA SYSTEM



Delineation of Ground-Water Flow Systems in Nevada

by
M. D. Mifflin

STATE OF
NEW YORK

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Desert Research Institute
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A far more commonly observed temperature range extends from the mid 50's to the mid 60's (°F). These temperatures average about 10° F above local average air temperature, and they prevail in many shallow or moderate depth wells constructed within most alluvial basins in the northern half of the state. These temperatures appear to be associated with ground water that has circulated to moderate depths in "local" ground-water systems.

A third temperature range frequently noted in ground water in Nevada is between the mid 60's to about 80° F. Temperatures within this range are often observed in relatively deep wells constructed in foothills or valley margin areas in the northern part of Nevada, in vicinities of thermal springs throughout most of the state and within alluvial basins in several areas of southern Nevada. These temperatures seem to be either associated with 1) lateral flow in moderate to low permeability rock environments where depth to saturation is commonly several hundred feet, 2) ground water which has circulated to moderate depths through indurated rocks which permit interbasin or regional flow systems and 3) ground water associated with localized concentrations of thermal ground water, usually near major structural features.

Locally, many areas within the state have even higher ground-water temperatures. In general, occurrence of hot wells and springs is more localized areally than lower temperature ground water. In areas of thermal ground water there is not necessarily a direct correlation between depth and encountered temperature of ground water (for example in the southwestern part of Truckee Meadows and in Pahrump Valley), yet there seems little doubt that the frequent occurrence of abnormally high temperatures observed in ground water is related to deep circulation.

Many geothermal gradients (change in temperature with respect to depth) could be illustrated in Nevada by picking the area. However, it seems likely that the gradients of 1° F to 2° F per 100 feet of depth are more common than 3° F per 100 feet or more. If so, an approximate idea of depth of circulation of waters commonly encountered can be made, i.e., waters in the 55° F to 65° F range may not have circulated much deeper than 2,500 feet, and perhaps much less. Similarly, waters of 65° F to 80° F may have circulated to about 4,000 feet or less. On the other hand, waters with temperatures much over 80° F are likely to have circulated quite deep, perhaps greater than 4,000 feet. Deep drilling in eastern Nevada has indicated "vuggy" porosity in dolomite to depths greater than 10,000 feet (Lintz, 1957, p. 61) and caverns to greater than 4,000 feet (Lintz, 1957, p. 47). Also several reports of "fresh" water at depths greater than 4,000 feet (Nevada Oil and Gas Commission files) from drill stem tests would suggest deep circulation of considerable flux, and

Nevada Test Site deep well samples and fluid potential measurements fully confirm similar deep circulation of ground water (Winograd, 1963).

In Nevada, it appears that average heat flow may be in the neighborhood of 2.1 to 2.36 $\mu\text{cal}/\text{cm}^2 \text{ sec}$. (Lee and Uyeda, 1965), however, local areas are known to have much higher rates (White, 1957a). The "normal" geothermal gradient of Nevada may be higher than many other continental areas where heat flow measurements cluster around 1 $\mu\text{cal}/\text{cm}^2 \text{ sec}$. However, a multitude of complicating conditions makes it difficult to recognize truly representative measurements. For example, in hydrothermal areas most authorities agree that abnormal heat flow and temperature gradients are a result of heat being transferred to near land surface by upward circulating high temperature water. Thus, on a local basis and perhaps even in some entire ground-water basins, upward movement of ground water may be a more efficient mechanism of heat transfer than normal conductivity, and in some situations may be sufficient to greatly modify the "normal" gradient of an area.

Significant to flow system analysis is the apparent meteoric source of the majority of high temperature ground water. Several studies (Craig, *et al.*, 1954, 1956; White, 1957a, 1957b, 1961, White *et al.*, 1963; DeGrys, 1965) have demonstrated that most, if not nearly all, thermal ground water that has been studied in detail is in some manner related to the normal hydrologic cycle. Water chemistry and stable isotope studies as well as other considerations indicate that in any given sample the majority of water is meteoric water (from precipitation) not greatly different from other ground water in the region with respect to certain isotope ratios. Thus, ground-water temperature may be used to study configuration of circulation. The heat displayed by ground water is somewhat a relic parameter, just as is water chemistry, and as such may indicate environments through which it has passed. It is suggested that temperature gives rough indication of depth of circulation in ground-water flow systems, but unfortunately its value is weakened by the usual absence of knowledge of the source of heat in any particular area.

The actual source of heat is problematical. Usually the immediate heat source cannot be clearly delineated in a tectonically active environment such as Nevada. Localized Quaternary volcanism is known throughout much of the Basin and Range Structural Province, as well as is the existence of deep-seated and relatively active faults. Where some sub-surface temperature data is available in Nevada, such as from wildcat test holes and ABC test holes in central and southern Nevada, temperatures at depth are relatively uniform over large areas. Unfortunately, most temperature data has been obtained in freshly constructed wells where temperature equilibrium has not been reestablished at the time of